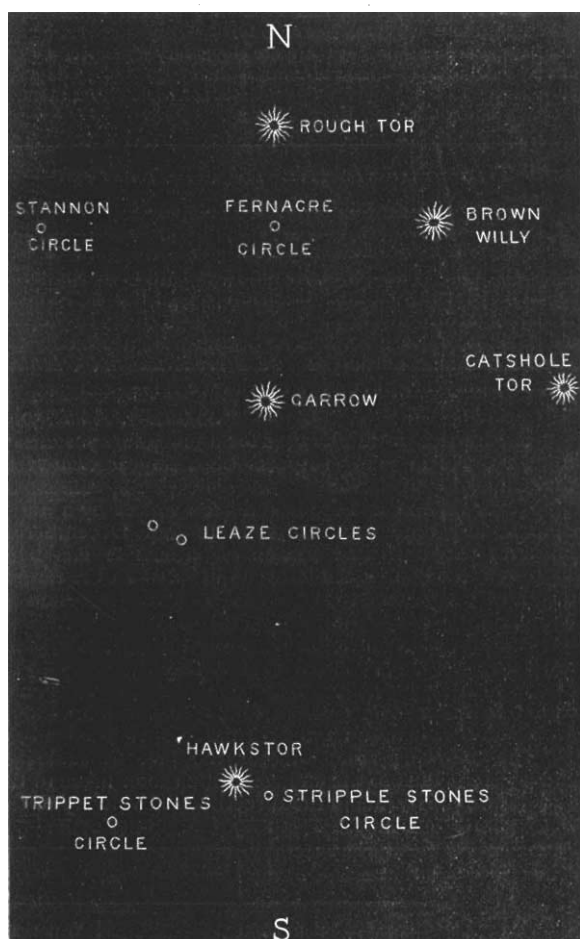


More remarkable, perhaps, than the position of these circles are their distances from each other, which, on the level map, are almost exactly as 3, $7\frac{1}{2}$, 2, and 8, for the sides of the irregular four-sided figure, of which four of the circles form the corners, while the diagonals are of the same length within a hundred feet, the differences being much less than the 1 per cent. which Mr. Flinders Petrie has found to be the average error of ancient British and even Assyrian workmanship. The builders of these



circles may be supposed to have aimed in their measurements at even numbers of some unit, and the unit which gives the best results appears to be a Royal Persian or Egyptian cubit of 25.1 inches (not at all the unit one would expect). The actual measurements, as nearly as I can get them from the 6-inch Ordnance map, are:—

	Feet.	Cubits of 25.1 inches.
Stannon Circle to Fernacre Circle ...	6275	= 3000
Fernacre Circle to Stripples Stones ...	15730	= 7520
(Practically 7500 cubits)		
Stripples Stones to Tripple Stones ...	4180	= 1998.4
(Practically 2000 cubits)		
Tripple Stones to Stannon Circle ...	16575	= 7924
(Probably meant for 8000 cubits)		

Diagonals.

Fernacre Circle to Tripple Stones ...	16950	= 8103
Stannon Circle to Stripples Stones ...	16350	= 8055
(Perhaps meant for 8125 cubits)		

It must not be forgotten that these measurements are taken from the level map, while the ground between the circles is very irregular, but it seems more probable that the builders of these circles made allowance for the irregularities of the ground than

that the distances, as shown by the map, are merely the result of accident.

If, however, the 25.1 inch cubit were the unit of measurement for the distances between the circles, it ought to appear in the measurements of the circles themselves—and it does; for the diameter of the Trippet Stones Circle is exactly fifty of such cubits, and the diameters of the Fernacre and Stripples Stones Circles are (as nearly as I can judge in their ruinous condition) seventy of such cubits.

The Egyptians appear to have constructed separate buildings for the observation of the sun and of the stars, but if the circle builders used the same circles for both purposes, placing them so that when standing in them they could see the sunrise over a fixed point on one hill, and a certain star rise over a fixed point on another hill in another direction, their system was much more economical, though perhaps less exact than that of the more civilized Egyptians.

A. L. LEWIS.

The Height of the Nacreous Cloud of January 30.

THE cloud referred to by Mr. T. W. Backhouse, in your issue of February 18 (p. 365), attracted universal attention over Eastern Yorkshire and even in Lincolnshire, so that numerous letters were sent to the *Leeds Mercury*, *Yorkshire Post*, &c.

Its general appearance in these parts is being dealt with by Mr. H. Bendelack Hewetson, of Leeds. I will therefore merely state that the intensity of the fringes surpassed anything in my previous experience. Even those observed in 1884-85, in connection with the Krakatō glows, did not approach it in this respect.

Here, as it happened, Venus lay just upon its lower edge. As this was fairly horizontal, save for a break not far from the middle, I was very pleased to get from Mr. C. J. Evans, Ackworth, near Pontefract, a second observation. In response to further appeals, observations, of varying accuracy, from the places in the subjoined table, were available for calculating the height.

Leeds (Prof. A. Lupton saw the cloud "nearly overhead," "if not, a little S.S.W.," "within 20° of the vertical"), Ackworth, and York enable us to determine the direction and position of the central part of the lower edge of the cloud as seen from the north and east. They give a point just above Mirfield Junction, 9 miles S.S.W. from Leeds, 32 miles S.W. from York and 13½ miles W. of Ackworth. The Driffield direction passes the same spot. The only other record, Market Rasen, is very divergent, the observer there putting the centre point south of west, whereas Mirfield is north of west.

The altitude of this point was capable of closer determination, thanks to references to Venus and Jupiter. The results of careful reductions are given in degrees in the following table, accompanied by the corresponding heights in miles, and distances and directions from Mirfield.

Place.	Miles from Mirfield.	Direction from Mirfield.	Altitude in degrees.	Resulting height above Mirfield.	Observer.
1 Ackworth ...	13½	E.	40° (245°)	11 (213½)	C. J. Evans, &c.
1 Tadcaster ...	22	N.E.	35°-40°	15	C. Rawson.
1 York ...	32	N.E.	22½°	13½	J. E. Clark.
1 Wetwang ...	50	E. N.E.	16½°	15½	E. M. Cole.
1 Driffield ...	56	E. N.E.	10°-15°	16	J. Lovell.
1 Hull ...	54½	E. by N.	12°	13	S. Bowen.
1 Market Rasen ...	58	E.S.E.	16°	15	W. Whiteman.
1 Sunderland ...	88	N. by E.	7½°	14	T.W. Backhouse.

The adopted height from the above eight records is 14 miles, or 75,000 feet.

The Leeds record gives 25 miles, but Prof. Lupton wrote only from memory, in response to inquiry after some interval. It may, however, indicate that the south-west edge of the cloud was more nearly above Leeds. By shifting it 4 miles in that direction the Leeds height becomes 16 miles, and that for Ackworth 11½ miles, Tadcaster 12½, York 12, and the rest, except Market Rasen (unchanged), become half a mile less. The mean result, taken as before, but now including Leeds, is 13.6 miles, or substantially the same.

1 As the records at these stations appeared to be much the more trustworthy, double weight is given them in the reduced value. In the Ackworth value, four times the weight is assigned to the 40° as to the 45°, the latter, on inquiry, being stated to be less probable.

The more distant localities did not, of course, view the same edge as those nearer, but one which must have been rather nearer them and lower down. Thus they are subject to a positive and a negative source of error, which cannot be well estimated, but which fortunately tend to neutralize each other.

The resulting height is unexpected, but the records agree so nearly as to leave little doubt of its substantial accuracy. Mr. Backhouse's measurements were made merely for altitude and an hour later, but the cloud-shift was so slight that it has been included.

J. EDMUND CLARK.

A Dust Storm at Sea.

A FEW days ago, while returning to Tokio from the southern part of Japan, I joined the s.s. *Yokohama Maru*, which, whilst crossing from Shanghai to Nagasaki had passed through a curious dust storm. Small quantities of the dust were yet to be seen in sheltered corners of the vessel. The commander, Captain R. Swain, who gave me a specimen of the material, told me that on April 2, when about 95 miles west by south of Nagasaki (long. 128° E., lat. $32^{\circ} 20'$ N.), at about 6 p.m. the sun appeared quite yellow. The atmosphere was moist, and rendered everything upon the deck of the ship quite damp. The precipitated moisture was yellowish, and as it dried it left an extremely fine powder. For two days previously the wind had been blowing west-south-west, or from China. Nothing was felt in the eyes, and if the ship had not been covered with yellow powder, the phenomenon would have been regarded as an ordinary but peculiarly coloured fog.

The yellow atmosphere was noticed during the afternoon of the 2nd. At midnight the wind changed to north-west—that is, from Corea. The probability, however, is that the material came from the loess plains of China. In Nagasaki, which is 390 miles from the coast of China, a yellow sun was noticed on the morning of the 2nd; and during the day, whilst dust was being precipitated, the appearance of the atmosphere was compared to that of a London fog.

On April 1 there was a fall of dust in the neighbourhood of Nawa in Okinawa-ken, and on the 2nd dust fell in Gifu—the district where the recent great earthquake took place. The P. and O. s.s. *Verona*, which left Hong Kong on April 1, experienced the same phenomenon as the *Yokohama Maru*, the vessel being covered with a fine dust, which, when suspended in the atmosphere, gave rise to so much haze that land was not seen until reaching Nagasaki. On April 3 a yellow sun was seen in Yokohama, but I am not aware that any dust was observed. Roughly speaking, it therefore seems that on April 2, at a distance of from 200 to 400 miles from the coast of China, there was a cloud of dust which may have been over 1000 miles and possibly 2000 miles in length. Dr. B. Koto, who examined a specimen, tells me that the particles are chiefly felspar, but there is a little quartz and shreds of plants.

JOHN MILNE.

Tokio, April 23.

Submerged Forest.

DURING a recent visit to an East Lincolnshire seaside place, Mabelthorpe, the remains of a submerged forest were pointed out to me plainly visible at low water. On closer inspection, the stumps of fallen trees, firmly embedded in the clay from one to twenty inches above the surface could be traced along the low-water level. I should be much obliged if any reader could fix a date at which the forest was growing. Does it not prove a subsidence of land in the neighbourhood?

M. H. M.

Carnivorous Caterpillars.

I SHOULD like to know if it is a known fact that some caterpillars are carnivorous, eating their own kind, and small ones of another kind? I have found on a lime-tree on our lawn, six caterpillars, two of which have done so.

One of them has (though there was plenty of food, as I had only taken it from the tree a few minutes) eaten one of its own kind about three-quarters its own size; and later on in the day a small green looper (off the lime-tree), which was in the same box. A second has eaten two small loopers. The other three I only found to-day, and they are not as large as those which had eaten their fellows.

I cannot find a description of this caterpillar in "Das Buch der Schmetterlinge" (Lutz), which I use.

They are of a bright green, the colour of the young lime leaves, with a narrow white line down the back and along each

side half-way down, and a broader one lower down. Between this and the narrow side-stripe are three very small black spots; between the back line and the narrow side-line, are two black spots, to each segment. Each spot has a white edge. On the first two segments the upper two spots are one under the other; but on the rest are side by side. The three spots form an L, with the two lower ones very near, or on the broad side-line.

They have eight prolegs, as well as the two suckers at the back. They appear very irritable, and swing their heads from side to side when touched, and apparently nip other caterpillars which dare to touch them in any way.

I may also mention that there are three very fine specimens of the Red Admiral (*Vanessa Atalanta*) in our garden to-day and yesterday.

JULIET N. WILLIAMS.

Blackbrook, Bickley, Kent, May 29.

THE HURRICANE IN MAURITIUS.

THE devastation caused by the hurricane in Mauritius was so terrible that it was hardly to be expected the Observatory would be spared. We are glad to say, however, that it suffered no damage; and all meteorologists will congratulate themselves that the well-known Director, Mr. Meldrum, was able without delay to prepare an account of the storm. The account is printed in the special overland edition of *The Merchants and Planters Gazette*, May 11. We here reproduce it:—

"Saturday, April 30.

"The hurricane which raged for a few hours yesterday, April 29, has in many respects been unprecedented in Mauritius.

"Never till now has the island been visited by a hurricane at any time between April 12 and December 1. Hitherto the hurricane season of Mauritius has been supposed to begin on the latter and to end on the former day, and till yesterday there has been no exception to the rule.

"Nor was there any sign of danger till yesterday, when the barometer began to fall rapidly and the wind to increase to a heavy gale. The suddenness, rapidity, and extent of the changes which took place in a few hours are unparalleled in the annals of the colony.

"The following table will for the present suffice to convey some idea of the changes which took place in the barometric pressure and the direction and velocity of the wind from 9 a.m. on the 24th to 9 p.m. on the 29th:—

Day and Hour.	Barometer.		Wind.	
	Cor. and reduced to sea-level.	Fall or Rise per hour cor. for var.	Mean Direction.	Velocity in miles per hour.
	Inches.			
April 24				
9 a.m.	30.059	—	E.S.E. $\frac{1}{2}$ S.	3
April 27				
9 a.m.	29.903	—	E. by S.	15
April 28				
9 a.m.	.905	—	N.E. by E.	12
4 p.m.	.816	—0.003	N.E. by E.	14
9 p.m.	.850	—0.006	N.E.	12
April 29				
6 a.m.	.660	—0.018	N.E. by E.	22.4
8 "	.630	—0.029	N.E. $\frac{1}{2}$ E.	34.7
9 "	.576	—0.063	N.E. by E.	35.0
10 "	.480	—0.094	E.N.E. $\frac{1}{2}$ N.	40.0
11 "	.338	—0.131	N.E. by E.	52.0
Noon	.066	—0.251	N.E. $\frac{1}{2}$ E.	68.0
1 p.m.	28.517	—0.532	N.E. $\frac{1}{2}$ E.	96.5
2 "	27.990	—0.513	N.	56.0
3 "	28.034	+0.048	W.N.W.	68.0
4 "	.520	+0.483	W.S.W.	112.0
5 "	29.059	+0.529	S.W.	82.0
9 "	.719	+0.151	S. Wrd.	26.0